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October 26, 2004

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Federal Communications Commission
Office of Secretary

Marlene H. Dortch, Esq.
Secretary
Federal Communications Commission
445 - 12th Street, SW, Room 8B201
Washington, DC 20554

Re: IP-Enabled Services
WC Docket No. 04-36
Vonage Petition for Declaratory Ruling
WC Docket No. 03-211
Notice of Oral Ex Parte Communication

Dear Ms. Dortch:

I am writing this letter to report that on October25, 2004, Alexander Netchvolodoff, Senior Vice President of Public Policy of Cox Enterprises, Inc., Alexandra Wilson, Vice President, Public Policy, of Cox Enterprises, Inc., and I, acting on behalf of Cox Communications Inc. ("Cox"), met with Christopher Libertelli, senior legal advisor to Chairman Powell, and Aaron Goldberger of the Wireless Telecommunications Bureau concerning the above-referenced proceeding. During the meeting, we discussed issues relating to the appropriate jurisdictional assignment for voice over IP services as provided over managed IP networks, consistent with Cox's recent filings in this proceeding. As part of the discussion, we provided information on the differences in signaling between voice over IP networks and circuit-switched networks. We also provided a copy of the attached analysis of jurisdictional issues, which had been filed previously with the Commission, to Mr. Goldberger.

In accordance with the requirements of Section 1.1206 of the Commission's rules, the original and three copies of this letter are being submitted to your office on this date and copies of this letter are being sent to Mr. Libertelli and Mr. Goldberger.

Please inform me if any questions should arise in connection with this letter.

Sincerely,

No. of Copies rec'd 0+3
List ABCDE

J.G. Harrington
Counsel to Cox Communications, Inc.

Attachment
cc (w/o attach.): Christopher Libertelli, Esq.
Aaron Goldberger, Esq.

VOICE OVER IP JURISDICTION

In contrast to voice services provided over traditional circuit-switched networks, voice services offered over IP networks use fundamentally new technology that is not constrained by the limitations of local geography. This new technology requires the Commission to analyze the jurisdictional issues surrounding voice over IP with fresh eyes. The following discussion undertakes the jurisdictional analysis by examining the plain language of the Communications Act and applying it to the unique topology of IP networks. The analysis demonstrates that, as a matter of network architecture and as a matter of law, voice services provided over managed IP networks are interstate services. The Communications Act gives the Commission jurisdiction over interstate wire communications and expressly defines "wire communication" to include "the transmission of . . . *signals*." As discussed below, interstate *signaling* and other essential interstate activities are integral to almost all voice over IP services, thus placing these services squarely under the Commission's jurisdiction as interstate wire communication. This jurisdictional determination applies regardless of whether the service is classified as a Title I information service or a Title II telecommunications service.

Background

One of the most significant benefits of IP network technology is that it enables service providers to use centralized facilities, located in national or regional data centers, to serve numerous, geographically dispersed markets. In contrast to circuit-switched networks (in which network equipment and related functionalities are located in a specific geographic location), the design of IP-based networks is not constrained by local geography. IP technology permits service providers to disperse critical functionalities, including switching and other intelligent features, throughout IP networks to achieve cost and system efficiencies. This network design

also permits providers to offer a single, integrated service that includes both local and long distance calling and a host of other features that can be supported from a centralized location. This freedom from geographic limitations, which is a hallmark of IP technology, inevitably results in many if not all critical network functionalities being performed across state lines, rather than being constrained within individual state boundaries (as is typically the case for circuit-switched technology).

As provided by Cox over its privately managed IP network, interstate signaling and other functionalities are integral to its provision of voice over IP service. Cox currently supports its voice over IP service in Roanoke, Virginia from its national data center located in Atlanta, Georgia.[1] This data center contains the softswitch and related equipment that is used to direct all voice over IP traffic over Cox's network and to perform numerous other activities essential to providing Cox's voice over IP service.[2] Even in the expected final implementation of Cox's nationwide voice over IP deployment (which currently is underway), Cox will have softswitches and associated facilities in only a few regional data centers, because there is no need to incur the cost and inefficiency of installing separate facilities in every state where Cox will offer the service. This likely will be the case for all or nearly all other voice over IP providers as well.

From the moment that a Cox voice over IP customer in Roanoke picks up the telephone handset to the time that the customer returns the handset to its cradle, the softswitch and related equipment in Atlanta engage in a variety of dynamic activities that involve ongoing

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[1] Cox began its commercial deployment of residential voice over IP service in Roanoke in December 2003. By the end of 2004, new Cox voice over IP services will be provided in Tulsa, West Texas, Baton Rouge and Southwest Louisiana. As it rolls out voice over IP in additional markets over the coming months, Cox will use the Atlanta data center to support those deployments as well.

[2] A schematic diagram of the Cox network topology is shown on Attachment 1.

communication across state lines. A few of these interstate signaling activities (i.e., call addressing) involve both the caller and the call recipient. Many other activities, however, are undertaken only at the Atlanta data center, regardless of the locations of the caller and the call recipient. For example, record-keeping for every call (essential to support billing, diagnostic functions, call detail reporting, etc.) is performed by the record-keeping server in Atlanta.[3] Similarly, when anyone places a call to a Cox voice over IP customer (whether located in the same state or in a different state), the softswitch in Atlanta generates the phone ringing, line busy, or other data and conveys that data across state lines to the calling party.[4] Still other functions that must be performed at the softswitch and associated facilities in Atlanta include CALEA compliance; voice mail recording, storage and retrieval; generation of announcements; and other features such as *67, conferencing, or call waiting. *Without these interstate signals and other essential interstate functionalities, Cox's voice over IP service would not function.*

Legal Analysis

The Statutory Language

Section 2(a) of the Communications Act gives the Commission jurisdiction over all interstate wire communications. "Wire communication" is defined in Section 3(52) to include "the transmission of . . . *signals* . . . between the points of origin and reception of such transmission, including all instrumentalities, facilities, apparatus, and services (among other things, the receipt, forwarding, and delivery of communications) incidental to such

[3] The record-keeping server at the center must engage in interstate communications with the call origination point, but does not communicate with the call termination point.

[4] In contrast, in circuit-switched networks (including those that employ out-of-band signaling), the local switch located close to the call termination point typically generates the phone ringing, line busy, or other data and conveys that data to the local switch located close to the call origination point. Accordingly, if the caller and recipient are located in the same state, this data would follow the call path and travel in-state from one endpoint of the circuit-switched call to the other.

transmission." (Emphasis added.) As described above, voice over IP services provided over a privately managed IP network such as Cox's entail a host of integral interstate signaling and other activities. These interstate activities, without which voice over IP service could not be offered, place the service under FCC jurisdiction as interstate wire communication.

The language used in Sections 2(b) and 221(b) – the two provisions that limit the FCC's jurisdiction in certain respects – does not negate this conclusion. First, Section 2(b) gives the states jurisdiction only over "charges, classifications, practices, services, facilities, or regulations for or in connection with *intrastate* communication service by wire or radio of any carrier." Because voice over IP service includes interstate signaling and other essential interstate functionalities, the service is not "intrastate communication" under the Act. Accordingly, Section 2(b) does not apply.

Second, Section 221(b) provides that the states retain jurisdiction over "charges, classifications, practices, services, facilities or regulations for or in connection with wire, mobile or point-to-point radio telephone exchange service or any combination thereof . . . in any case where such matters are subject to regulation by a State commission or by local governmental authority." The courts consistently have held that the purpose of Section 221(b) is solely to ensure that states do not lose jurisdiction when a local exchange happens to cross state lines.[5] Again, that situation does not apply here.

Importantly, Sections 2(b) and 221(b) never have been held to extend the states' intrastate jurisdiction to encompass signaling and other critical network functions that are interstate. To the contrary, in analogous situations in which a service includes an integral interstate component,

[5] *Public Utility Comm'n of Texas v. FCC*, 886 F.2d 1325, 1331 (D.C. Cir. 1989) ("*Texas PUC*"); *North Carolina Utilities Comm'n v. FCC*, 552 F.2d 1036, 1045 (4th Cir. 1977).

the FCC and the courts have determined that jurisdiction resides with the Commission, not the states.[6] Accordingly, Section 2(b) and Section 221(b) do not override the FCC's undisputed Section 2(a) interstate jurisdiction here.

The Comparison to Circuit-Switched Service

The jurisdictional analysis for voice over IP service is different from, but consistent with, the jurisdictional analysis for circuit-switched service. For the latter service, the Commission traditionally has used the so-called "end-to-end" analysis, which analyzes a service as a whole for jurisdictional purposes rather than dividing the service into different piece parts and assigning them to different jurisdictional categories. In virtually all situations, this approach has been used to ensure that the FCC retains interstate jurisdiction over a service even when the service also entails some intrastate activity. In its seminal access charge decision in 1983, for instance, the Commission rejected claims that it did not have the authority to set charges for interstate access because access facilities typically did not cross state lines, and held that "[t]he origination or termination of an interstate communication, including the use of a local loop between an end user's home or office and a local switch of a local exchange carrier, is necessarily a part of an interstate communication."[7]

Although the Commission's end-to-end analysis is well suited to assessing jurisdictional issues posed by a variety of traditional circuit-switched services, it is not so readily applicable to voice services provided over new IP networks. As described above, there are critical differences

[6] See discussion *infra* at 6-8.

[7] MTS and WATS Market Structure, *Third Report and Order,* 93 FCC 2d 241, 261 (1983), *aff'd, NARUC v. FCC,* 737 F.2d 1095 (D.C. Cir. 1984), *cert. denied,* 105 S.Ct. 1224 (1985). *See also* Petition for Emergency Relief and Declaratory Ruling Filed by the BellSouth Corporation, *Memorandum Opinion and Order,* 7 FCC Rcd 1619, 1620-21 (1992) (*"MemoryCall"*) (voice messaging service was interstate in nature even though all of the facilities used to provide it were located in the same state as the subscribing party because the service was used to accept messages from interstate callers).

between voice over IP signaling and the way that signaling is and has been handled in circuit-switched service. With the exception of addressing signals in some instances, voice over IP signaling occurs between the call origination point and the softswitch (and associated facilities) in the national or regional data center; it does not involve the recipient endpoint. In contrast, during the period when the jurisdictional analysis for circuit-switched service was being developed, circuit-switched signaling followed the call path, so there was no distinction between the signaling and content routing. Moreover, even after the advent of out-of-band signaling for circuit-switched service in the 1980s, signaling typically remained intrastate for calls in which the caller and recipient were located in the same state and interstate for calls in which the caller and recipient were located in different states – hence, the jurisdictional analysis was not affected. This remains true today of nearly all circuit-switched implementations, including those involving a limited number of switches serving a wide area, because the signaling follows the same call path as the content, and critical service functions still are performed at those switches located close to the endpoints of the call.[8] In short, the Commission has never separately considered signaling in the circuit-switched jurisdictional analysis because it has had no reason to do so.[9]

The end-to-end analysis developed for traditional circuit-switched networks cannot be applied directly to managed voice over IP networks because the signaling paths are not the same. The end-to-end analysis assumes a single beginning and a single end for both content and signaling, which makes sense in light of the functions performed by local switches in circuit-

[8] In circuit-switched networks, functions such as recording call data and generating busy signals are performed at the local switch, even when out-of-band signaling is deployed. These functions are performed at the softswitch in voice over IP networks.

[9] The Commission has considered signaling-related issues in various other contexts before, such as the transmission of caller identification information. *See, e.g.*, 47 C.F.R. § 64.1601 (requiring carriers to pass caller identification information).

switched networks. As shown above, this assumption does not apply to voice over IP because those functions and many others are performed at the centralized data center. Put differently, when the signaling path diverges from the content path, the jurisdictional analysis has to account for both paths.

While the end-to-end analysis does not apply directly, a voice over IP analysis that encompasses interstate signaling and other functionalities, and treats the service as interstate, is consistent with the principles the Commission used to develop the end-to-end theory. The Commission's "whole service" approach to developing the end-to-end analysis (1) rejected the division of a communications service into separate piece parts for the purpose of jurisdictional analysis;[10] (2) focused on whether the communication crossed state lines at some point to support interstate jurisdiction;[11] and (3) insisted on classifying the entire service in the same jurisdictional category rather than placing anomalous, individual cases in a different jurisdictional category.[12]

Applying these same principles to voice over IP, the jurisdictional analysis must encompass the entire service, including the interstate signaling and other interstate functionalities that are essential to the service. Although the content packets may not cross state lines in every

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[10] *See, e.g., MemoryCall*, 7 FCC Rcd at 1620-21 (declining to divide calls to voice mail service into interstate and intrastate components); Southwestern Bell Telephone, *Order Designating Issues for Investigation*, 3 FCC Rcd 2339, 2341 (1988) (treating credit card calls as a single call rather than separate calls from customer to interexchange carrier switch and from switch to called party).

[11] *See, e.g.,* New York Telephone Co., *Memorandum Opinion and Order*, 76 F.C.C.2d 349, 352-353 (1980) (physically intrastate foreign-exchange facilities used to carry interconnected interstate traffic are subject to federal jurisdiction); *see also NARUC v. FCC*, 746 F.2d 1492, 1498 (D.C. Cir. 1984) (physically intrastate in-WATS line is an interstate facility when used to terminate an interstate communication).

[12] *See, e.g.,* Petition of the New York Telephone Company for Declaratory Ruling with Regard to the Physically Intrastate Private Line and Special Access Channels Utilized for Sales Agents to Computer New York State Lottery Communications, *Memorandum Opinion and Order*, 5 FCC Rcd 1080 (1990).

instance, voice over IP service as provided over a managed IP network such as Cox's simply does not function without the use of interstate signaling and other interstate activities. *The Communications Act – specifically, the Act's definition of "wire communication" – does not allow the Commission to ignore these integral and critical interstate functionalities of voice over IP service when performing the jurisdictional analysis.*[13] Moreover, dividing the service into separate piece parts, and assigning the interstate activities to the Commission's jurisdiction and the transmission of certain content packets to the fifty states' jurisdiction, would be not only impractical but also completely contrary to Commission and court precedents, which traditionally have examined voice services as integrated wholes when analyzing their jurisdictional nature.[14] And, the "whole service" approach further dictates the conclusion that voice over IP service is intrinsically interstate, not intrastate, because the involvement of essential interstate activities creates FCC jurisdiction under Section 2(a) of the Act that cannot be overridden by Section 2(b).

Finally, the Commission consistently has categorized services as a class. For circuit-switched service, Congress and the Commission have recognized as anomalies those few cases where a switch is located outside a state or a local exchange happens to cross state lines. In such instances, Congress and the Commission have not subjected the anomalies to a different jurisdictional regime (e.g., by declaring circuit-switched service in such situations to be interstate). Rather, they have rightly determined that one jurisdictional category should apply to

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[13] 47 U.S.C. § 3(52).

[14] *See, e.g.*, GTE Telephone Cos.; GTOC Tariff No. 1; GTOC Transmittal No. 1148, *Memorandum Opinion and Order*, 13 FCC Rcd 22466 (1998), 7 FCC Rcd at 1621) (Commission "has rejected attempts to divide communications at any intermediate points of switching or exchanges between carriers") (citing *MemoryCall); see also Texas PUC*, 886 F.2d at 1334 (finding federal preemption of state regulation of network interconnection *via* microwave appropriate where interstate and intrastate components of the switch were technologically inseverable).

all circuit-switched services (which typically have switches and associated facilities located in-state).

In the voice over IP context, there similarly may be some instances when the national or regional data center happens to be located in the same state in which the service is offered. The Commission should recognize that these cases will be exceptions to the general rule and should encompass them within the scope of its interstate jurisdiction. This approach not only would be consistent with the Commission's circuit-switched precedents; it also would eliminate any concerns that voice over IP providers would install switches in a particular location for jurisdictional reasons rather than to promote network efficiency.

The Policy Issues

In other contexts, the traditional "whole service" approach to jurisdictional analysis has led the FCC to assert jurisdiction – and the courts to affirm – even when the result is federal regulation of purely intrastate communications. For example, under the inseverability doctrine, the FCC has taken jurisdiction over inside wire and customer premises equipment that support both interstate and intrastate services.[15] Similarly, the Commission has adopted the "10 percent" rule for mixed use private line services.[16] The FCC need not apply the inseverability doctrine here because the interstate signaling and related interstate functionalities are integral to the voice

[15] Detariffing the Installation and Maintenance of Inside Wiring, *Second Report and Order*, 59 R.R.2d 1143 (1986), *as modified by Memorandum Opinion Order*, 1 FCC Rcd 1190 (1986), *and Memorandum Opinion and Order*, 3 FCC Rcd 1719 (1988), *aff'd sub nom. National Association of Regulatory Utility Commissioners v. FCC*, 880 F.2d 422 (D.C. Cir. 1989) (inside wiring); Amendment of Section 64.702 of the Commission's Rules and Regulations, *Final Decision*, 77 F.C.C.2d 384 (1980), *as modified by Memorandum Opinion and Order*, 84 F.C.C.2d 50 (1980), and *Memorandum Opinion and Order on Further Reconsideration*, 88 F.C.C.2d 512 (1981), *affirmed sub nom. Computer and Communications Industry Assoc. v. FCC*, 693 F.2d 198 (D.C. Cir. 1982) (consumer promises equipment).

[16] MTS and WATS Market Structure, *Decision and Order*, 4 FCC Rcd 5660 (1989), *recon. denied*, 16 FCC Rcd 11167 (2001).

over IP service itself and independently establish the service as interstate wire communication. Nonetheless, these cases are instructive because they demonstrate the importance of placing services that entail both interstate and intrastate aspects under federal jurisdiction in order to accomplish national policy goals.

Here, even if the Act did distinguish between content and signaling packets in its definition of "wire communication" (which it does not), giving states full power over the content packets in certain voice over IP calls would frustrate the FCC's ability to adopt uniform national rules to regulate the inseverable interstate signaling (and related) functionalities. Indeed, because interstate signaling and related functionalities are integrally intertwined with each and every voice over IP call – regardless of whether the content packets remain in or leave the state – division of the service into jurisdictionally separate piece parts becomes impracticable. Under these circumstances, traditional approaches to separating interstate and intrastate services simply do not, and cannot, apply.

Moreover, state regulation could impose heavy burdens on privately managed voice over IP service providers, thereby thwarting the federal policy of promoting new competition and services and undermining the FCC's ability to develop a national, streamlined regulatory framework for IP-enabled voice services. There are states, including states where Cox provides circuit-switched service, that continue to impose significant regulatory requirements on competitive telephone service providers. For instance, in Virginia, Cox is subject to price cap and service quality standard requirements that the FCC would be unlikely to apply to an interstate service provider. In California, Cox is subject to detailed and costly service quality and consumer protection regulations. In Arizona, Cox is subject to "fair value" regulations that require state commission approval to raise rates above those in approved tariffs, even though

Cox has no market power. And in Oklahoma, Cox is subject to price caps and must provide cost justification for new offerings and price changes.

Imposing such regulations on voice over IP providers would significantly increase the cost of providing innovative IP services to consumers.[17] In addition, some of these regulations could pose special cross-boundary problems for voice over IP service providers, such as how to deal with the costs of out-of-state softswitches that serve markets in multiple states. Disparate state regulations also could make regional/national pricing and marketing for voice over IP services more difficult (e.g., by requiring providers to comply with disparate caps and floors and/or different state tariffing requirements). Accordingly, the principles underlying the inseverability and mixed use doctrines apply even more strongly in the voice over IP context, and those principles fully support a Commission determination that voice services provided over managed IP networks such as Cox's broadband infrastructure are jurisdictionally interstate.[18]

Finally, classification of voice over IP services as interstate need not raise any concerns that voice over IP providers will design their networks simply to evade intrastate jurisdiction. This concern might arise with regard to circuit-switched networks because the location of switches across state lines typically would result in operational inefficiency and thus disserve the public interest. For voice over IP, however, the dispersion of critical functionalities, including switching and other intelligent features, throughout IP networks promotes cost and system

[17] For similar reasons, Cox has urged the Commission to take all possible steps to create a uniform regulatory framework for all competitive voice service providers, regardless of whether they use IP or circuit-switched technology. See Cox Comments at 17-20.

[18] It should be noted that classification of voice over IP services as interstate does not eliminate any state role in these services. For instance, as Cox previously has described (Cox Comments at 13-16), states should retain their role in arbitrating interconnection disputes. Sections 251 and 252 do not make any distinction between interstate and intrastate providers, and consequently a determination that voice over IP services are interstate would not have any effect on those provisions. 47 U.S.C. §§ 251, 252.

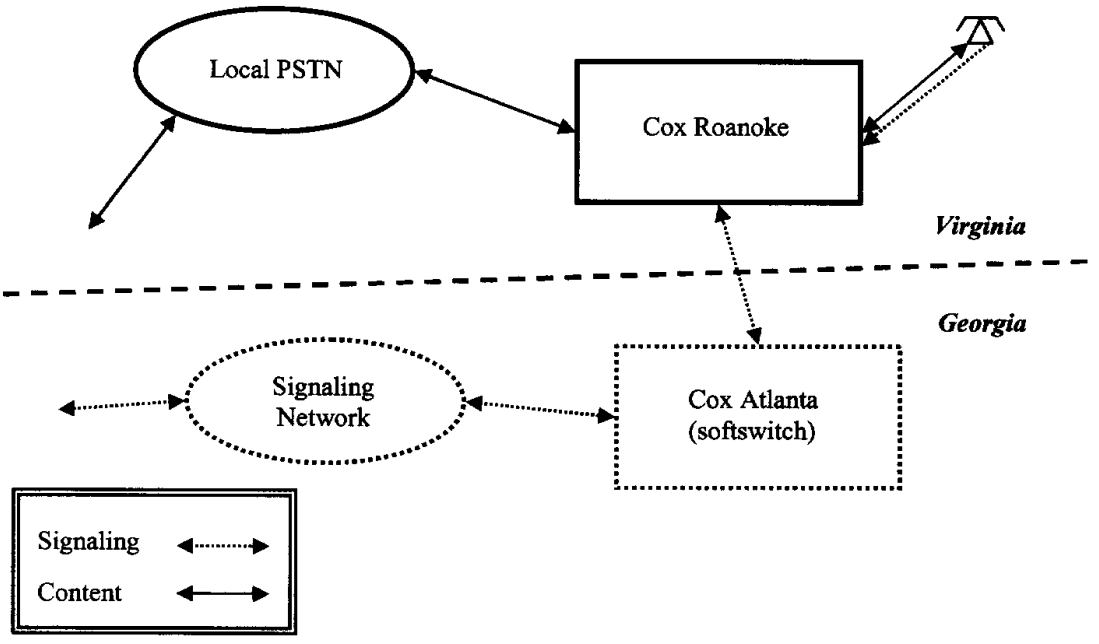
efficiencies and is more economic than the circuit-switched model of numerous local switches. Indeed, a primary incentive for providers to deploy IP networks is to utilize centralized facilities that can cost-effectively serve far flung markets that have low customer density. Given the very significant network and operational efficiencies that accrue from implementing IP technology, a voice over IP service provider would have no incentive to ignore those efficiencies simply to secure a more favorable jurisdictional classification. And, in any event, if the Commission classifies all voice over IP calls as interstate as discussed above, it would eliminate any lingering concerns that providers might employ such a strategy.

Conclusion

Voice over IP services are not provided in the same way as circuit-switched services, and the Commission must evaluate the jurisdictional implications of these new technologies in light of the specific language of the Communications Act. This analysis shows that voice over IP services offered via managed networks have intrinsic, integral interstate components that necessarily make these services subject to the Commission's jurisdiction. This conclusion is consistent with the principles the Commission and the Courts have used in analyzing the jurisdictional status of other services, with prior Commission policy and with the goal of promoting new, beneficial competition in the communications marketplace. Simply stated, voice over IP presents a special case where network architecture and operational efficiency, statutory language and public policy all point to the same conclusion – voice over IP service is an interstate service, as a matter of network topology and as a matter of law.

ATTACHMENT 1

Basic Elements of Cox Managed IP Network Topology



Notes:

1. No signaling is generated at the local facilities in Roanoke.
2. Only call-addressing data is passed from softswitch to signaling network.
3. Record-keeping, announcement generation, CALEA, voice messaging, vertical features, etc. are performed at the softswitch.
4. The softswitch generates signals indicating that the line is ringing or is busy for incoming calls.
5. This diagram omits the regional data center that passes information between the caller and the softswitch and related facilities in Atlanta.